

REMARKS

Claims 1-7, 9-16, and 18-26 are pending.

By this Amendment, Claims 8 and 17 are cancelled without prejudice or disclaimer; the dependency of Claims 5-6, 9, 11, and 13-14 has been amended; the subject matter recited by Claims 3-4 and 7-8 has been incorporated into Claim 1 herein by amendment; the subject matter recited by Claim 17 has been incorporated into Claim 15 herein by amendment; Claim 1 being further amended to recite features discussed on page 12, lines 4-11, and page 13, lines 7-9 of the application as originally filed; and Claim 15 being further amended to recite features discussed on page 15, lines 9-13 of the application as originally filed.

Applicant respectfully submits that no new matter is presented herein.

Claim Rejections Under 35 U.S.C. §102/§103

Claim 1 is rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent Application Publication Number 2002/0031453 to Ogino; and under 35 U.S.C. 102(e) as being anticipated by U.S. Patent Application Publication Number 2004/0081861 to Parchamazad and U.S. Patent Application Publication Number 2003/0035983 to Ukai et al. (Ukai).

Claims 1-4, 6-10, 13, 15, 17 and 19-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent Application Publication Number 2006/0182680 to Keefer et al. (Keefer) in view of Ogino; Claims 1-4, 6-10, 13, 15, 17 and 19-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Keefer in view of Parchamazad; Claims 5, 12 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over a) Keefer in view of Ogino and/or b) Keefer in view of Parchamazad

as applied to Claims 3-4 and 15 above, and further view of U.S. Patent No. 4,233,132 to Carr et al. (Carr); and Claims 11,14, 18 and 21-26 are rejected under 35 U.S.C. 103(a) as being unpatentable over a) Keefer in view of Ogino and/or b) Keefer in view of Parchamazad as applied to Claims 3-4 above, and further view of Applicant's Admission of Prior Art (AAPA).

Applicant respectfully traverses each of the rejections for at least the following reason(s).

Addressing the §102 rejections first, Applicant respectfully notes independent Claim 1 recites, among other features, purification means having at least a membrane separator, an adsorber, and first and second passages. These features were previously recited by Claims 3-4 and 7-8, which are not rejected by Ogino, Parchamazad or Ukai. In other words, the Office Action essentially **admits** that Ogino, Parchamazad and Ukai fail to teach or suggest a purification system having the features recited by Claim 1.

To establish a proper rejection under 35 U.S.C. §102, each and every feature recited by a rejected claim must be disclosed or taught by the applied art of record.

As noted above, Ogino, Parchamazad and Ukai fail to teach or suggest a purification system having the features recited by Claim 1. Accordingly, Claim 1 is not anticipated by Ogino, Parchamazad and/or Ukai and is therefore not anticipated by, or rendered obvious in view of, Ogino, Parchamazad and Ukai. Therefore, Applicant respectfully submits that Claim 1 should be deemed allowable over Ogino, Parchamazad and Ukai.

As for the rejections under 35 U.S.C. §103, Applicant provides the following comments.

Regarding Claim 1, Applicant submits that the claimed invention is characterized in that the reformed gas is separated by a membrane separator into hydrogen gas and a first offgas containing a carbon compound, and then the resulting purified hydrogen gas is provided to the adsorber where the hydrogen gas is further separated into hydrogen gas and a second offgas (moisture). The moisture removed from the hydrogen gas is stored in the tank for later use, and since there still remains a small amount of hydrogen in the separated second offgas, the second offgas is provided back upstream of the fuel cell to be used for generating electric power.

The re-use of the second offgas by the fuel cell to generate electric power is made possible by the claimed invention because the carbon compound is effectively eliminated at the membrane separator arranged upstream of the adsorber, thereby enabling the use of the hydrogen contained in the reformed gas without any waste to generate electric power.

On the other hand, although Keefer suggests that other gas separation devices could be substituted for the PSA (see paragraph [0095] of Keefer), Keefer does not teach or suggest using *both* PEM *and* PSA to successfully purify hydrogen. That is, while Keefer appears to suggest using one or other separation devices, Keefer never suggests using multiple types of separation devices. See Figure 6 of Keefer.

Alternatively, looking at Figure 1 of the instant application, it can be seen that PEM and PSA are both used to purify the hydrogen, the PEM and PSA being the membrane separator and adsorber recited by Claim 1.

Moreover, while Keefer discloses that the offgas containing hydrogen, carbon monoxide, and others is provided to the low pressure burner (290) through the conduit (285) from the PSA module (1') (see paragraph [0112] of Keefer), Keefer does not teach or suggest that the first offgas is provided back to the reformation means, the second offgas is provided back to the fuel cell, as recited by Claim 1.

Applicant respectfully submits that Ogino, Parchamazad, Carr and/or the AAPA, either alone or in any combination thereof, fail to teach, cure, or otherwise address the above-discussed deficiencies of Keefer.

Regarding Claim 15, Applicant submits that hydrogen purification has conventionally been conducted by passing hydrogen gas through a plurality of containers charged with adsorbent by a low-pressure compressor. The invention recited by Claim 15 does not use a low-pressure compressor as the compression or pressurizing is conducted by the PEM (or membrane separator) that is provided with a function for compressing the hydrogen, which is arranged upstream of the adsorbent (see page 15, lines 9-13 of the application as originally filed). Then, as in Claim 1 above, the PSA (or adsorber) is used to further purify the hydrogen by removing the moisture therefrom

As discussed above with regards to Claim 1, Keefer fails to teach or suggest the concept of using both a PEM and a PSA. Therefore, a pressurizing apparatus different than an adsorbent needs to be arranged in Keefer.

Applicant respectfully submits that Ogino and Parchamazad, either alone or in any combination thereof, fail to teach, cure, or otherwise address the above-discussed deficiencies of Keefer.

Therefore, Applicant respectfully submits that Claims 1 and 15 are not anticipated by, or rendered obvious in view of, the applied art of record, i.e., Keefer, Ogino, Parchamazad, Ukai, Carr and the AAPA, alone or in any combination thereof, and should be deemed allowable.

Claims 2-7 and 9-14 depend from Claim 1; and Claims 16 and 18-26 depend from Claim 15. It is respectfully submitted that these dependent claims be deemed allowable for at least the same reason(s) Claims 1 and 15 are allowable as well as for the additional subject matter recited therein.

Withdrawal of the rejections is respectfully requested.

Conclusion

In view of the above, reconsideration of the application, withdrawal of the outstanding rejections, allowance of Claims 1-7, 9-16 and 18-26, and the prompt issuance of a Notice of Allowability is respectfully requested.

Should the Examiner believe anything further is desirable in order to place this application in better condition for allowance, the Examiner is requested to contact the undersigned at the telephone number listed below.

In the event this paper is not considered to be timely filed, the Applicant respectfully petitions for an appropriate extension of time. Any fees for such an extension, together with any additional fees that may be due with respect to this paper, may be charged to counsel's Deposit Account No. 01-2300, **referencing Attorney Dkt. No. 101175.00045.**

Respectfully submitted,



Murat Ozgu
Attorney for Applicant
Registration No. 44,275

Customer No. 004372

ARENT FOX LLP
1050 Connecticut Avenue, N.W., Suite 400
Washington, D.C. 20036-5339
Tel: (202) 857-6000
Fax: (202) 638-4810

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